

Alaska Sustainable Salmon Fund Project Completion Form

Grant Number: [To be filled in by AKSSF Staff]

Project Number: 455554

Project Title: AYK – Kuskokwim Chinook Salmon Run Reconstruction, Part II

Project Manager: Douglas B. Molyneaux

Duration of Project: 4/1/07 to 4/30/09

Abstract:

We propose to reconstruct Kuskokwim River Chinook salmon runs from 1975 through 2007, as a tool to understanding factors affecting salmon production. We will first estimate the number of adult Chinook in the entire Kuskokwim River in 2006 and 2007 by continuing a radio telemetry mark-recapture study that provides estimates of abundance in the middle and upper Kuskokwim River, concurrent with measures to estimate abundance for the Aniak River and lower Kuskokwim tributaries. We will then extend our abundance time series back to 2002 by expanding the 2002 through 2005 radio telemetry estimates to include the entire Kuskokwim River. We will next extend the times series back to 1975 by analyzing escapement data from 1975 through 2007 to create a drainage-wide index of annual escapement, and apply the abundance estimates from 2002 through 2007 as a scalar to estimate annual abundance for each of the indexed years. Finally we will apply historical age composition data to the annual estimates to investigate potential spawner-recruitment relationships as an initial approach to understanding mechanisms that drive variations in abundance. Our proposal is time sensitive in that it builds on numerous existing platforms. Furthermore, it incorporates a unique partnership of a state agency, Tribal organizations, and a consulting statistician with University review and consultation, together with capacity building and outreach components.

Approach:

To achieve our end goal of a retrospective estimate of Chinook salmon abundances in the Kuskokwim river from 1976-2007 we had to analyze multiple data sets and first attain confident estimates of total inriver abundance. To estimate total inriver abundance we utilized abundance estimate data from Stuby et al. (2003; 2004; 2005; 2006; 2007) and conducted a mark recapture estimate of our own in 2007.

The 2007 mark recapture estimate was conducted using a two sample method with Chinook salmon being captured near Kalskag with fish wheels and drift gillnets and being recovered at each of five weirs. Methods that were employed in 2007 were similar to that of Stuby (2007). To assess suspected biases of disproportional tag recoveries in the Aniak River, we installed and operated the Salmon River weir on the Aniak River. We will be able to assess the tag recoveries at the Salmon River weir and verify if there is indeed a disproportionate number of Aniak River bound Chinook salmon in 2006 and 2007. This may allow us to expand previous estimates derived by Stuby (2003; 2004; 2005; 2006; 2007) to include the Aniak River.

The statistical retrospective run reconstruction model will compile all available harvest, escapement, and brood year information using maximum likelihood methods to estimate total inriver abundance of Chinook salmon in the Kuskokwim River back to 1976.

Results/Findings:

The final analysis and retrospective modeling are being finalized, and preliminary results suggest that we will be successful in reconstructing the Chinook salmon inriver abundance back to 1976. We expect to have the report finalized and published by 30 June 2010.

Evaluation:

All objects are being met. Successful operation of the Salmon River weir allowed us to successfully address the previously perceived tagging disproportion into the Aniak River.

The retrospective run reconstruction model has been finalized and preliminary estimates appear to be reasonable. We are still waiting for the finalization of numbers for subsistence harvest in the final two years of our analysis before the results will be final.

Project Products:

The final report is underway and will be published in the Alaska Department of Fish and Game, Fisheries Data Series. The expected date of publication is 30 June 2010.

We will provide AKSSF the required project report upon completion and publication.

Key Words: Kuskokwim River, Chinook salmon, Run reconstruction,

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